The product of this process is a lava-like material called sinter. The sinter is broken into various sizes and sorted by size. The larger pieces are transferred to the Unloading Building via conveyors. The undersized pieces are returned to the sinter machine feed after crushing. Approximately 50% of the sinter machine feed is undersized material.

2.3 Blast Furnace

The sinter from the Sinter Plant is directly deposited in one of three proportioning hoppers in the Unloading Building five days per week. These hoppers feed the "charge car" which contains the feedstock materials that charge the Blast Furnace. Some sinter is deposited in a large storage bin in the Unloading Building, typically on weekend days to provide reserve sinter that can be added to the hoppers by the overhead crane during times when the Sinter Plant is not operating.

The charge car is lifted to the top of the operating Blast Furnace and its contents are dumped into the furnace. The furnace shaft is fed from the top. Inside the shaft, the sinter is reduced by air and coke to form molten lead bullion. The flux materials form slag.

The bullion and slag are continuously tapped from the front of the furnace into a brick-lined settler where they are separated by gravity. The bullion is tapped into covered pots. The slag is generally granulated with water, cooled, and transported by conveyor belt to the Sinter Plant where it is recycled. Approximately one-third of the granulated slag is transported by truck and dumped onto the slag pile. During the infrequent times when the granulation system is not operational, the slag is tapped into pots, transported, and dumped onto the floor to cool. The cooled slag is then hauled to the slag pile.

The pots of bullion are lifted by an overhead crane and dumped into receiving kettles which are covered by ventilated hoods. As the bullion cools, a copper dross floats to the surface. Periodically, this dross is removed by skimming.

After the dross has been removed, the rough-drossed bullion is transported by ladle to the Refinery.

2.4 Refinery and Molding

The lead bullion from the receiving kettles is further refined by the removal of copper, silver, zinc, and other trace impurities. These refining steps are performed in kettles and involve the addition of various reagents. Most of the processes are conducted at a temperature just above the melting point of lead and consequently, emissions are minimal.

The refined lead is pumped to the molding department where it is molded into sizes and shapes requested by customers.

The molded lead is primarily shipped from the plant in semi-trucks although some is shipped by rail.

3.0 Work Practices for the Control of Fugitive Lead Emissions

These work practices are intended to inform employees of preestablished procedures that will minimize fugitive lead emissions caused from such activities as materials handling and maximize the effectiveness and longevity of installed fugitive emissions control equipment.

Maintenance activities in the Glover Plant are requested with a computer-based Work Order system. The Work Orders are ranked in descending priority from "Priority 1" through "Priority 6". Following is a description of the priority levels:

Priority 1 - Needs immediate attention;
Priority 2 - Needs to be completed within 7 days;
Priority 3 - Routine planned work;
Priority 4 - Downtime work;
Priority 5 - Preventive maintenance; and
Priority 6 - Downtime immediate action.

Records maintained pursuant to this Manual of Work Practices will be retained for five years by the party responsible for their completion or in a central ASARCO file. All records maintained pursuant to this manual will require the initials or signature of the person filling out the record form.

The Environmental department will keep a record of upsets in the plant that lead to unexpected lead emissions. An example of this would be spills of lead bearing material. This environmental incident report will note the duration, possible cause, estimates of emissions, and detail any corrective actions taken to correct the situation. A form for this purpose is given in Supplement A.

3.1 Concentrate Unloading

The primary control of fugitive lead emissions in this department is accomplished by the enclosed sides of the Unloading Building. The enclosed walls and doors prevent wind from entering the building and subsequently transporting lead-bearing dust out of the building. The dust is generated by material handling and dumping activities inside the building. The applicable work practices supporting emissions controls focus on maintaining enclosed conditions for the Unloading Building.

3.1.1 Keeping Building Doors Closed During Material Handling Operations

Numerous roll-up doors will be installed to allow truck, railcar, front-end loader, and other vehicle access to the bins. The doors will be closed except during dumping from trucks and/or front-end loaders into storage bins. The doors will only be open during the dumping phase and will be closed immediately after dumping.

The exception to this practice is the unloading of baghouse dust. This dust must be dumped into a storage bin through a door on the West side of the building. The door will be immediately closed after a cellar is cleaned and all dust transported to the bin.

3.1.2 Maintenance of Doors and Siding

All doors and siding will be inspected regularly and repaired promptly.

The Unloading Supervisor will inspect the condition of the doors and siding once per week. If holes or openings are found in the doors or siding, repairs will be completed within 7 days of detection.

If a door is found that cannot be fully closed, either during the weekly inspection or during normal work, the door will be immediately corrected so that it will close. The door will not be opened during operations until it has been repaired to allow normal opening and closing.

The Unloading Supervisor will keep records of the weekly inspections using a form found in Supplement A.

3.2 Sinter Plant

Control of fugitive lead emissions in this department requires the effective enclosure and ventilation of the Sinter Plant. Lead dust inside the Sinter Plant is generated by the movement of materials and by the sintering machine itself. The applicable work practices that support these emission controls focus on maintaining enclosed conditions and maintaining proper building ventilation.

3.2.1 Keeping Building Doors Closed

The doors to the Sinter Building will be closed except when people or equipment are entering or exiting the building.

3.2.2 Maintenance of Doors and Siding

All doors and siding will be inspected regularly and repaired promptly.

The Sinter Plant Supervisor will inspect the condition of the doors and siding once per week. If holes or openings are found in the doors or siding, repairs will be completed within 7 days of detection.

The Sinter Plant Supervisor will keep records of the weekly inspections using a form found in Supplement A.

3.2.3 Sinter Building Washdown

Material spilled onto the lower floor will be collected and returned to the process using hoses and front-end loaders. Washdown will be performed once per day at a minimum when the ambient temperature is above 39° F. Washdown activities will be noted on sinter process logs.

3.2.4 Sinter Building Ventilation

Operation of the sinter machine will be initiated only if the Sinter Building ventilation is operating. Sinter Building ventilation will be operated for at least 48 hours after the shutdown of the sinter machine.

The ventilation system will undergo quarterly inspections as described in Supplement B.

3.3 Blast Furnace Area

3.3.1 Filling of Bullion Pots

Blast furnace employees will be trained in work practices to avoid overfilling of lead pots.

3.3.2 Use of Bullion Pot Covers

Blast furnace employees will be trained in work practices to recognize deficient covers. Appropriate Work Orders will be submitted for the repair of damaged covers.

Buillion pots will not be filled unless a proper pot cover is used.

3.3.3 Use of Point Source Ventilation Systems

The point source ventilation systems for the blast furnace area include: 1) the front of the furnace and tapping area; 2) the receiving (dross) kettles; and 3) the top of the furnace.

Operation of a blast furnace and the associated bullion and slag tapping, kettle bullion transfers; or treatment in the dross kettles will be initiated only if the appurtenant point source ventilation systems are operable.

The processes of the blast furnace area are initiated by a large increase in temperature that begins a self-sustaining, continuous process. Once initiated, these processes cannot be stopped immediately and must wait for the temperature of the system to slowly drop below a level where the self sustaining portion of the process begins to diminish. If during operation, excessive emissions are seen, the applicable point source ventilation system will be inspected immediately. Based on the inspection the next course of action will be chosen. This could include one of the following options: 1) reduce the blast furnace processes as much as possible to minimize excess emissions; 2) provide alternate ventilation; or 3) begin complete cessation of the blast furnace operations.

A Work Order of appropriate "Priority" status will be submitted to coordinate with the course of action chosen.

3.3.4 Periodic Inspection of Point Source Ventilation Systems

The point source ventilation systems in the blast furnace area will undergo quarterly inspections as described in Supplement B.

Records will be kept of these system inspections on a form found in Supplement A.

3.3.5 Prevention and Response to Blow Holes

The blast furnace operators will ensure that enough feed material is in the furnace to provide a sufficient seal at the top of the furnace.

If a blow hole should occur, prompt action will be taken to seal the hole. This action could include shooting the area around the hole with explosives or adding additional feed material.

Blow hole occurrences and the corrective actions taken will be recorded on the Blast Furnace Daily Log Sheet by the supervisor in charge, after the condition has been corrected.

3.3.6 Execution of Sodium Treatment

Liquid sodium will be injected below the surface of the bath to prevent excess emissions.

3.3.7 Refinery Area Washdown

Material spilled onto the floor will be collected and returned to the process using hoses and front-end loaders. Washdown will be performed once per day at a minimum. Washdown activities will be noted on refinery process logs. For safety reasons, washdown will not be performed if the temperature is below 39° F.

3.4 In-Plant Roads

The In-plant roads are illustrated in Figure 3-1. A combination of sprinkling and sweeping will be used, as needed to minimize road dust.

3.4.1 Sprinkler Systems

The traffic routes controlled by sprinklers are identified in Figure 3-1. These sprinkler systems will be maintained in proper working condition. Systems will be operated when the ambient temperature is above 39° F.

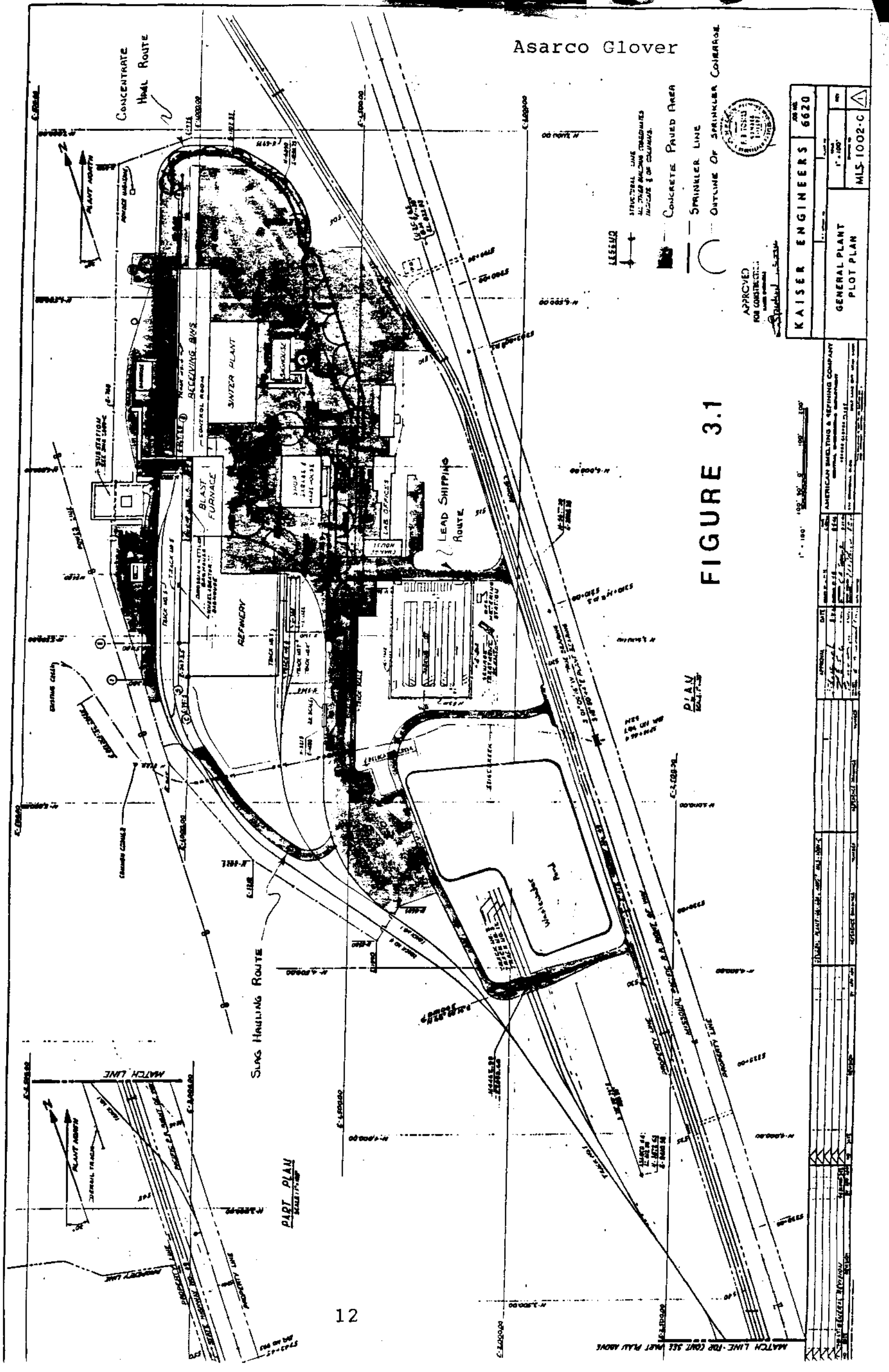
The systems will be inspected once per day by the Environmental Department. Records of the daily inspections will be kept in the Environmental Daily Log.

If a sprinkler system is providing less than full coverage of a traffic route through which vehicles drive, the following actions will be taken: 1) that section of the system will be inspected to determine the possible cause of the malfunction; 2)a "Priority 3" Work Order will be submitted; 3) all traffic will be routed around the area not covered until a) an alternate sprinkler/wetting system is setup or b) the area is dried and vacuum swept to a condition where minimal visible dust exists.

Records of the corrective actions taken will be kept in the Environmental Daily Log.

Exhibit A

Asarco Glover



3.4.2 Road Sweeping

The In-plant roads will be swept as needed to minimize dust loading and during times when sprinkler system cannot be operated, such as during periods when the ambient temperature is below 39° F or during a malfunction of a sprinkler system section as described above. The areas controlled by sweeping are identified in Figure 3-1.

The sweeper will be operated according to the following schedule on a five days per week, six hours per day basis. The sweeper will not operate when the concrete is wet.

1. The concentrate truck unloading road will be swept a minimum of three times per day.

2. The refined lead truck road from the plant entrance to the refined lead loading area to the plant scale will be swept three times per day.

3. The slag haulage road from the plant scale to the rear plant entrance will be swept once per day.

4. The area between the maintenance shop and the blast furnace baghouse will be swept once per week. Additional sweeping will be done if visible suspended emissions exist in the area.

5. The area between the unloading building and the blast furnace baghouse will be swept twice per week. Additional sweeping will be done if visible suspended emissions exist in this area.

The sweeper will be operated and maintained according to the manufacturer's recommendations as provided in Supplement C.

3.5 Baghouse Cleaning

The objective of this procedure is to minimize, control, and prevent the escape of fugitive dust during the removal, transportation, and unloading of Sinter Plant Ventilation and Blast Furnace baghouse dust. The procedures are similar for each baghouse.

The Sinter Plant supervisor shall be responsible for assuring that baghouse dust unloading is conducted according to this procedure. The supervisor is responsible for training the hourly employees in the proper procedures. The supervisor shall inspect any baghouse dust unloading operation to ensure the procedures are followed. The supervisor shall be responsible for a log of all cellar cleaning activity.

Consideration should be given to wind. Windy conditions can lead to significant lead emissions during baghouse dust transport. Baghouse cleaning will not be done if the Sinter Plant supervisor feels that the local wind conditions would cause visible emissions.

Two employees shall perform the unloading procedure: a front-end loader operator and a baghouseman who operates the high pressure water hose and acts as a safety man.

A front-end loader is used to clean the cellars and transport the dust. The plant dump truck may be used on occasion to transport the dust.

The following steps are taken:

1) The damper is closed on the cellar to be cleaned;

2) Airborne dust is allowed to settle;

3) The main access door to the cellar is opened and the hose inserted to wet the dust as much as practical;

4) As the payloader cleans the cellar the baghouseman continues to wet the dust;

5) The dust is transported to the Unloading Building and dropped into the storage bin at as low level as possible to minimize the drop of the dust;

6) When the cellar is cleaned, the cellar door is resealed and the chamber put back in service by opening the damper. The roll-up door at the Unloading Building bin will be closed;

7) The doors are checked for leaks and corrected as necessary;

8) The area is cleaned by washing down with the hose and picking up any material with the payloader.

9) The area is to be kept clean with a vacuum sweeper as required.

3.6 Baghouse Inspections

The baghouses are designed to filter particulate from ventilation and process gas streams. The purpose of baghouse inspections and baghouse particulate alarms is to ensure that the baghouses are operating properly, and to identify problems that can be corrected.

All baghouses will be inspected weekly for leaks using visual methods. The baghouse supervisor will be responsible for these inspections. Records of these inspections will be kept. If the weekly baghouse inspection indicates a problem with the baghouse, appropriate corrective action will be taken. The corrective actions will be noted on the inspection forms.

The baghouses will be inspected quarterly employing Visolite® tests according to the procedure in Supplement D. The baghouse supervisor will be responsible for these inspections. Records of these inspections will be kept.

Continuous particulate monitors will be operated whenever the Blast Furnace, Sinter Process, or Sinter Building Ventilation Baghouses are operated. If the signal from the continuous particulate monitor exceeds the output observed during a normal cleaning cycle, the alarm will sound.

If a baghouse alarm sounds, the following actions will be taken:

1. The baghouse operator will attempt to identify the cause of the alarms. This may mean locking out different cells in the baghouse and noting the output signal of the particulate monitor.

2. If the problem is identified, an appropriate work order will be submitted. Until corrective action has been taken, the baghouse will

be operated such that lead emissions are minimized.

3. If the problem could not be immediately identified, the problem will be reported to the environmental department for further review. This review will include a complete baghouse inspection.

4. All alarms and corrective actions will be noted on an inspection form and filed for future reference.

4.0 Training

Training will be given to the plant employees that will communicate the purpose and requirements of this Manual of Work Practices.

Operation guidelines, their rationale, and their effects on minimizing fugitive lead emissions will be stressed in this training.

The training will be part of the annual training module given to each Glover Plant employee. New employees also receive this training. Employees transferred into specialized areas will receive training for their new area.

Specialized training will be the responsibility of the area supervisor. General training of this Manual will be the responsibility of the Environmental Department. Training records will be kept in the plant safety office.

Specialized training is provided for the following job classifications:

- ★ Baghouseman
- ★ Sweeper operator
- ★ Charge car operator
- ★ Furnaceman
- ★ Drossman

Supplement A

Recordkeeping Forms

Exhibit A **ASARCO INC,** MISSOURI LEAD DIVISION, GLOVER UNIT

ENVIRONMENTAL INCIDENT REPORT

DATE:________________ LOCAL TIME:____________ SKY COVER:____________

GROUND COND(WET,DRY,ETC):__________ DURATION:________ INTENSITY:________

DESCRIBE INCIDENT IN DETAIL:____

AREA SUPERVISOR ON DUTY:____________________ CORRECTIVE ACTION:________

SIGNATURE OF ENVIRONMENTAL SPECIALIST:____________________________

ASARCO GLOVER PLANT PROCESS BAGHOUSE INSPECTION SHEET

BAGHOUSE: ______________________ DATE: ____________

INSPECTOR: ______________________ TIME: ____________

CELL	MAGNEHELIC: GOOD	MAGNEHELIC: NEEDS ATTN:	DIAPHRAM: GOOD	DIAPHRAM: NEEDS ATTN:	TIME SETTING: GOOD	TIME SETTING: NEEDS ATTN:	BAGS: GOOD	BAGS: NEEDS ATTN:
1	( )	( )	( )	( )	( )	( )	( )	( )
2	( )	( )	( )	( )	( )	( )	( )	( )
3	( )	( )	( )	( )	( )	( )	( )	( )
4	( )	( )	( )	( )	( )	( )	( )	( )
5	( )	( )	( )	( )	( )	( )	( )	( )
6	( )	( )	( )	( )	( )	( )		

	GOOD	NEEDS ATTN:
FAN AMPS: ____________	( )	( )
AIR PRESSURE	( )	( )
SOLENOID VALVES	( )	( )

CORRECTIVE ACTION TAKEN: ______________________

DATE: ____________

BAG FAILURE	TOP	MIDDLE	BOTTOM
( ) TEARS	( )	( )	( )
( ) TORN SEAMS	( )	( )	( )
( ) PIN HOLES	( )	( )	( )

WHICH CELL: ____________

NO. BAGS REPLACED: ____________

CORRECTIVE ACTION TAKEN: ______________________

DATE: ____________

CAGE CONDITION: BENT: ________ BROKEN: ________ TIME: ________

CELL #: ________ NUMBER OF CAGES: ________ DATE: ________

WEEKLY MAGNAHELIC READINGS

CELL #	MON	TUES	WED	THUR	FRI	SAT	SUN
1							
2							
3							
4							
5							
6							

QUARTERLY VISOLITE TEST:
DATE: ____________
RESULTS: ______________________

CORRECTIVE ACTION TAKEN: ______________________

Exhibit A

Asarco Glover

ASARCO GLOVER PLANT WHEELABRATOR BAGHOUSE INSPECTION SHEET

BAGHOUSE: ______________________ DATE: ______________

INSPECTOR: ______________________ TIME: ______________

CELL	MAGNEHELIC GOOD	MAGNEHELIC NEEDS ATTN:	DIAPHRAM GOOD	DIAPHRAM NEEDS ATTN:	TIME SETTING GOOD	TIME SETTING NEEDS ATTN:	BAGS GOOD	BAGS NEEDS ATTN:
1	( )	( )	( )	( )	( )	( )	( )	( )
2	( )	( )	( )	( )	( )	( )	( )	( )
3	( )	( )	( )	( )	( )	( )	( )	( )
4	( )	( )	( )	( )	( )	( )	( )	( )
5	( )	( )	( )	( )	( )	( )	( )	( )

	GOOD	NEEDS ATTN:
AMPS 3906 FAN	( )	( )
AIR PRESSURE	( )	( )
SOLENOID VALVES	( )	( )

CORRECTIVE ACTION TAKEN: ______________

DATE: ______________

BAG FAILURE	TOP	MIDDLE	BOTTOM
( ) TEARS	( )	( )	( )
( ) TORN SEAMS	( )	( )	( )
( ) PIN HOLES	( )	( )	( )

WHICH CELL: ______________

NO. BAGS REPLACED: ______________

CORRECTIVE ACTION TAKEN: ______________

DATE: ______________

CAGE CONDITION: BENT: __________ BROKEN: __________ TIME: __________

CELL #: __________ NUMBER OF CAGES: __________ DATE: __________

WEEKLY MAGNAHELIC READINGS

CELL #	MON	TUES	WED	THUR	FRI	SAT	SUN
1							
2							
3							
4							
5							

QUARTERLY VISOLITE TEST:

DATE: ______________

RESULTS: ______________

CORRECTIVE ACTION TAKEN: ______________

DAILY BAG-HOUSE REPORT

Date:________

Sinter Plant

	1	2	3	4	5	6	7	8	9
Cellars fired									
Bags: Replaced									
Refiled									
Capped									
Dust Removed (Cat Buckets)									
Dampers working: Inlet									
Outlet									
Shakers Working									

Any Defects Noted:

Quality Visolite Test Results:

Spray Chamber	
No. of sprays cleaned	
Spray Temp. Control	
Baghouse Temp. Control	

Blast Furnace

	1	2	3	4	5	6
Cellars fired						
Bags: Replaced						
Refiled						
Capped						
Dust Removed (Cat Buckets)						
Dampers working: Inlet						
Outlet						
Shakers Working						

Please note the cause of any problems which occured in the last 24 hours, and any corrective action taken. When bags fail, describe as accurately as possible the location (top, middle, bottom; seam, bell, etc.)of the failure and possible cause.

Any Defects Noted:

Quality Visolite Test Results:

Spray Chamber	
No. of sprays cleaned	
Spray Temp. Control	
ʼouse Temp. Control	

UNLOADING BUILDING ENCLOSURE INSPECTION

DATE: ______________

	OK	NEEDS REPAIR	DESCRIPTION OF PROBLEM	CORRECTIVE ACTION	DATE W/O WRITTEN	DATE COMPLETED
SIDING CONDITION						
DOORS:						
DOOR #:						
1						
2						
3						
4						
5						
6						
7						
8						

INSPECTED BY: ______________________________

SINTER BUILDING ENCLOSURE INSPECTION

DATE: ____________

	OK	NEEDS REPAIR	DESCRIPTION OF PROBLEM	CORRECTIVE ACTION	DATE W/O WRITTEN	DATE COMPLETED
SIDING CONDITION						
DOORS:						
DOOR #:						
1						
2						
3						
4						
5						
6						
7						
8						

INSPECTED BY: ______________________

POINT SOURCE VENTILATION SYSTEMS QUARTERLY INSPECTION REPORT

DATE: ____________

BLAST FURNACE AREA PSV SYSTEMS	MINIMUM REQUIRED AIR FLOW ACFM	ACTUAL ACFM	VISUAL INSPECTION MECHANICAL & PHYSICAL CONDITION		W/O	DEFICIENCY	CORRECTIVE ACTION	DATE COMP.
			OK	NEEDS REPAIR				
1. FRONT OF FURNACE & TAPPING AREA	22,000							
2. RECEIVING KETTLES	15,000							
3. TOP OF FURNACE	60,000							

SINTER BUILDING PSV SYSTEMS	MINIMUM REQUIRED AIR FLOW ACFM	ACTUAL ACFM	VISUAL INSPECTION MECHANICAL & PHYSICAL CONDITION		W/O	DEFICIENCY	CORRECTIVE ACTION	DATE COMP.
			OK	NEEDS REPAIR				
1. PROCESS GASES	185,000							
2. SINTER BUILDING VENTILATION	100,000							

INSPECTOR: ______________________________

Supplement B

Point Source Ventilation Systems

Inspection and Maintenance Procedures

ASARCO Glover Plant
Blast Furnace Area and Sinter Building
Point Source Ventilation System
Inspection and Maintenance Procedures

Introduction

The Point Source Ventilation (PSV) Systems are designed to collect air from fugitive dust emission sources. The collected air (and the dust contained in it) is then routed to a baghouse where the dust is captured and subsequently accumulated for reprocessing.

The PSV systems for the blast furnace area include: 1) the front of the furnace and tapping area; 2) the receiving (dross) kettles; and 3) the top of the furnace. The PSV systems for the sinter building include: 1) sinter plant process gases; 2) sinter building ventilation; and 3) other conveying, crushing and mixing equipment PSV systems.

These systems undergo routine, periodic inspections to insure proper operation. The systems are also inspected prior to initiation of blast furnace operations after a period of down time greater than 1 day.

Routine Inspection Frequency

Routine inspections will be performed once per quarter. As part of these routine quarterly inspections, the Triboflow (or MDNR approved equivalent) continuous particulate monitors will be calibrated as necessary to alert operators when particulate levels in the exhaust gases are above those seen during normal bag cleaning cycles, subject to MDNR's right to observe, review and approve such calibration of the monitors.

Inspection Procedures

Visual Inspection - A visual inspection of the mechanical and physical condition of the systems is the fundamental procedure to be used. Any deficiencies will be noted and will be the subjects of the subsequent Work Order that will be submitted.

Air Flow Measurements - Sinter Building ventilation gases will be continuously measured and recorded. These rates will be recorded at a minimum of five minute intervals. The sinter process gas baghouse fan amperage will be recorded continuously (see explanation below). Other ventilation rates will be measured quarterly. The measured ventilation rates/fan amperages must be maintained above the following minimums:

Source/Area Ventilated	**Minimum Air Flow/Fan Amperage**	**Point of Measurement**	**Measurement Frequency**
Blast Furnace Ventilation - Total Flow	60,000 acfm	Just prior to spray chamber	Quarterly
Dross Kettles	15,000 acfm	Just downstream of the fan	Quarterly
Front of Blast Furnace	22,000 acfm	In flue leading to the sinter plant ventilation baghouse	Quarterly
Sinter Building Ventilation	100,000 acfm	90 inch flue leading from the header system to the intake at the baghouse	Continuously
Sinter Machine Process Gases	"*"		Continuously / Quarterly

The Sinter Plant Supervisor is responsible for assuring that the minimum ventilation rates are being met. If the calculated ventilation rates fall below these minimums, the Sinter Plant Supervisor will submit the appropriate work order for repairs. The corrective actions will be noted on an inspection report, and Environmental Department will be notified.

These minimum ventilation rates/fan amperages will not apply when